

**UNITED STATES APPLICATION**

**FOR**

**GRANT OF LETTERS PATENT**

**BY JiNan Glasgow**  
**of Raleigh, North Carolina, USA**

**for**

**AUTOMATED SYSTEM & METHOD FOR PATENT DRAFTING &**  
**TECHNOLOGY ASSESSMENT**

# AUTOMATED SYSTEM & METHOD FOR PATENT DRAFTING & TECHNOLOGY

## ASSESSMENT

### Background of the Invention

#### (1) Field of the Invention

The present invention relates generally to patent application drafting and technology assessment and, more particularly, to an automated system and method for patent application drafting, issued patent assessment, and technology assessment.

#### (2) Description of the Prior Art

Typically, patent applications and assessments of issued patents have been done manually, i.e., an inventor or patent practitioner independently outlines and drafts specification text and drawings to provide an adequate description and disclosure of an invention, including claims to subject matter that is patentably distinct from prior art references in such a manner as to meet the requirements for obtaining letters patent by the appropriate governmental authority or agency. Generally, each patent drafter constructs the text-based description and claims based upon an individual frame of reference, which is based upon experience, technical understanding of the invention, legal requirements, and personal writing style. Because these factors are substantially influenced by subjective perspective, for any given invention, variation as to patent drafting technique and substance of the text is common among inventors and patent practitioners. Thus, consistency of practice among patent drafters is not well established. Additionally, training new practitioners also lacks consistency, based upon the variation of drafting techniques that are taught by experienced practitioners. Therefore, a systematic approach to patent drafting is needed to provide a consistent and reliable means for drafting patent

1 applications and training others to do the same among existing patent drafters,  
2 particularly among professional practitioners.

3 Prior art patent drafting aids may employ computers, as set forth in US Patent No.  
4 6,049,811 issued April 11, 2000 to Petruzzi, et al., in order to provide a means for storing  
5 information related to an invention, including common subcomponents of a patent  
6 application, namely features and benefits of the invention that define the invention over  
7 prior art, primary elements of the invention that define the invention over prior art,  
8 secondary elements that are important but that do not necessarily define the invention  
9 over prior art, and substitute elements of the invention. These subcomponents are stored  
10 by a computer, with the descriptive text relating to each of them being provided by the  
11 patent drafter. A final patent application is compiled by combining these drafted sections  
12 with predetermined text. However, this computer-based type of prior art merely serves to  
13 prompt the user for information to be entered into a patent application and automatically  
14 draft a patent application therefrom, without providing any sort of outline or preview of  
15 the patent application substance so that editing may be done in an early stage of patent  
16 drafting, saving time and avoiding inconsistencies within the patent that is eventually  
17 drafted. Furthermore, there is little flexibility of form or format within the patent  
18 application being generated with computer assistance; the user does not have an  
19 opportunity to define relationships between and among subcomponents that may have a  
20 significant effect upon patentability as well as the user's understanding of the invention  
21 that is claimed for the purposes of enforcement or explaining it to others.

22 Thus, there remains a need for a systematic approach to patent drafting having a  
23 consistent and reliable means, preferably automated or assisted by automation, for

1 drafting patent applications and training others to do the same among existing patent  
2 drafters, particularly among professional practitioners, in order to ensure patent quality  
3 and to provide a common language or means for communicating the substance and form  
4 of a patent application and/or issued patent and/or technology that is being assessed.

5 Also, there remains a need for an automated version of the system and method for  
6 patent application drafting, issued patent assessment, and technology assessment that  
7 provides increased efficiency via reduced time for formatting and substantive text and  
8 diagrammatic representation construction of the same. Furthermore, there remains a need  
9 for an automated system and method for patent application drafting, issued patent  
10 assessment, and technology assessment that provides an outline or preview of the patent  
11 application substance so that editing may be done in an early stage of patent drafting,  
12 saving time and avoiding inconsistencies within the patent that is eventually drafted.

13 Also, there remains a need for such a system and/or method having flexibility of  
14 form or format within the patent application being generated with computer assistance  
15 such that the user(s) has an opportunity to define relationships between and among  
16 subcomponents that may have a significant effect upon patentability as well as the user's  
17 understanding of the invention that is claimed for the purposes of enforcement or  
18 explaining it to others. Additionally, there remains a need for such a system and/or  
19 method that permits a multiplicity of users to work on the same patent or technology  
20 simultaneously or in series, which is permitted only by a common understanding of the  
21 format, the substance, and the language or terminology selected by the user(s) to define  
22 the invention, patent, and/or technology such that little or no additional communication is

required among co-users or collaborators in order to function efficiently and effectively together.

### Summary of the Invention

It is an object of the present invention to provide an automated system and method for patent drafting, issued patent assessment, and/or technology assessment that provides increased efficiency via reduced time for formatting and substantive text and diagrammatic representation construction of the same.

It is another object of the present invention to provide a system and method for patent drafting, issued patent assessment, and/or technology assessment having a consistent and reliable format and process to ensure patent quality and to provide a common language or means for communicating the substance and form of a patent application and/or issued patent and/or technology that is being assessed.

Still another object of the present invention is to provide an automated system and method for patent application drafting, issued patent assessment, and technology assessment that provides an outline or preview of the patent application substance so that editing may be done in an early stage of patent drafting, saving time and avoiding inconsistencies within the patent that is eventually drafted.

Also, another object of the present invention is to provide an automated system and method for patent application drafting, issued patent assessment, and technology assessment that providing flexibility of form or format within the patent application being generated with computer assistance such that the user(s) has an opportunity to define relationships between and among subcomponents that may have a significant effect upon patentability as well as the user's understanding of the invention that is claimed for the purposes of enforcement or explaining it to others.

In a preferred embodiment of the present invention, a system for patent application drafting, issued patent assessment, and technology assessment includes a computer having input devices for at least one user to enter information relating to components of an invention in a hierarchical and relational categorization using software that automatically generates a relational, diagrammatic representation of the patent or technology being assessed that is output in a format that is viewable and modifiable by the user(s). Subsequently, the user(s) may enter additional, more detailed information that provides a basis for textual representation of the patent or technology that is being drafted or assessed; this additional information is associated with and/or connected to the diagrammatic representation, e.g., via an automatic link or a hyperlink, that permits the user(s) to switch between views of the diagram and the text-based detailed description of components of the patent. Subsequently, the components of the patent being drafted are formatted into a text-based arrangement that is suitable for filing as a patent application, with additional modifications, transitions, and/or standard language capable of being introduced prior to printing or electronic conveyance of the patent application for filing.

Similarly, in a preferred embodiment of the present invention, a method for using the aforementioned system is provided, including the steps of at least one user inputting information to a computer or other automated electronic device, the information being ordered in a hierarchical and relational categorization, the computer or device using software to automatically generate a relational, diagrammatic representation of the patent or technology being assessed, outputting the information in a format that is viewable and modifiable by the user(s), automatically generating a text-based format of the information consistent with the relational, diagrammatic representation of the information that is

1 consistent with a format that may be submitted for filing a patent, modifying the text-  
2 based format, as required, and outputting a printed or electronic version that may be  
3 conveyed to a third party for review and/or patent filing.

4 These and other aspects of the present invention will become apparent to those  
5 skilled in the art after a reading of the following description of the preferred embodiment  
6 when considered with the drawings, which constitute a part of the specification and  
7 include exemplary embodiments for the purpose of facilitating explanation of the present  
8 invention, which may be embodied in various forms.

#### 9 Brief Description of the Drawings

10 Figure 1 is a block diagram of a patent diagram of the system constructed according to  
11 the present invention.

12 Figure 2 is a block diagram of an alternative embodiment of the present invention.

#### 13 Detailed Description of the Preferred Embodiments

14 In the following description, like reference characters designate like or  
15 corresponding parts throughout the several views. Also in the following description, it is  
16 to be understood that such terms as “forward,” “rearward,” “front,” “back,” “right,”  
17 “left,” “upwardly,” “downwardly,” and the like are words of convenience and are not to  
18 be construed as limiting terms.

19 Referring now to the drawings in general, the illustrations are for the purpose of  
20 describing a preferred embodiment of the invention and are not intended to limit the  
21 invention thereto. In the following description, like reference characters designate like or  
22 corresponding parts throughout the several views. Also in the following description, it is  
23 to be understood that such terms as “forward,” “rearward,” “front,” “back,” “right,”

“left,” “upwardly,” “downwardly,” and the like are words of convenience and are not to be construed as limiting terms.

Referring now to Figure 1, a block diagram of a hierarchical component categorization according to the system of the present invention, generally referenced as 10, is shown. The method begins with the inputting of patent or technology elements or components, generally referenced as 12, into a data processor, such as a computer, by at least one user via an input device, e.g., computer keyboard, mouse, voice, etc. or combinations thereof. These components or elements are divided into key components or key elements, including the title 14, function or objective of the technology or invention 16, at least one key component 18, and overall benefit of the invention. The at least one key component 18 of the invention are those essential for functioning of the invention and those that are necessary for providing patentable distinction over the prior art 20, if any. Also, information relating to background and problems 22 may be input into the system as well. These initial or primary inputs are automatically configured into a hierarchical and relational diagrammatic format, which is generated by a software program and which is capable of being viewed by the at least one user on an output device, such as a computer screen, printed document or other tangible form. The at least one key component 18 may also have at least one subcomponent 24 that is relationally and hierarchically connected and configured automatically in the diagrammatic representation of the invention, patent, or technology in association with the at least one key component 18. Additionally, the at least one subcomponent 24 may also have at least one sub-subcomponent 26 that is relationally and hierarchically connected and configured automatically in the diagrammatic representation of the invention, patent, or



1 technology in association with the at least one subcomponent and the related at least one  
2 key component 18. As best shown in Figure 2, a multiplicity of key components,  
3 subcomponents and sub-subcomponents may be required for an adequate and complete  
4 description of the invention to be patented, patented invention, or technology being  
5 assessed. Each key component, related subcomponent, and related sub-subcomponents  
6 are input by the user(s) and automatically organized in a hierarchical and relational  
7 component categorization diagram that may be reconfigured later by the user(s) and  
8 updated automatically in the viewable output. The presentation of the diagram may be  
9 vertically oriented, horizontally oriented, or oriented in some other manner without  
10 departing from the organized hierarchical and relational categorization and configuration  
11 of the components considered within the scope of the present invention.

12 Other information may be advantageously included with the diagram 10, such as  
13 practitioner file number, client identifier, date, author, etc. in a predetermined location on  
14 the viewable output device or tangible representation or electronic format version of the  
15 diagram.

16 Furthermore, the at least one key components 18 do not necessarily need to be  
17 components of a specific embodiment as conventionally recognized in a patent  
18 application, but at least may be components generally required for the invention or  
19 technology to be functionally described in a concise and complete manner, as well as  
20 required for at least one broad claim of a patent application. In many cases, the at least  
21 one key component can be described functionally rather than by a specific embodiment,  
22 such as a data processor versus a personal computer. The at least one key component  
23 may then be further described or delimited by inputting subcomponents or other

1 delimiters subsequent to the entry or input of the at least one key component into the  
2 system. These subcomponents may then also be further described or delimited by  
3 inputting their subcomponents. This process can be continued until the at least one key  
4 component is completely described. The description or delimiting process consists of  
5 naming the subcomponent and adding the specific function and/or benefit or particular  
6 commercial usefulness that the subcomponent provides.

7         The at least one key component can be multiple key components. These may then  
8 be organized according to importance, function, order of use in the invention, novelty, or  
9 according to any other prioritization system that the patent drafter desires to use.

10         The overall benefit or usefulness of the invention is also inputted as a key element  
11 of the invention. This benefit or usefulness may be limited to the improvement provided  
12 by the invention, or may be a more thorough description of the function of the invention  
13 along with the enhancement of the function provided by the invention.

14         The inputting of these elements need not follow the order described here. In fact,  
15 some drafters of technology descriptions and/or patent applications might prefer to  
16 proceed with another order of inputting, such as beginning with a subcomponent and  
17 further deconstructing the subcomponent according to its function until the drafter  
18 believes he/she has arrived at a key component that cannot be further deconstructed.  
19 Alternately, the drafter may prefer to deconstruct a subcomponent until he/she believes  
20 that further deconstruction will generate an embodiment that cannot be patented, such as  
21 an embodiment that is not novel, useful, or non-obvious.

22         Simultaneous or subsequent to the data inputting process, the system  
23 automatically organizes the inputted components and their subcomponents into a

1 hierarchy based upon the user(s) inputs; the drafter may override or modify the initial  
 2 hierarchical order or organization thereafter. This hierarchy is one in which the  
 3 component and its subcomponent(s) are linked in a dependent manner or parent/child  
 4 relationship. The components are thus linked such that they can be outputted in a format  
 5 that preserves the hierarchy established by the drafter. The method also allows for the  
 6 multiple hierarchy charts, such that multiple charts can be display alternately or  
 7 simultaneously. This function can be important if a patent drafter is unsure of the  
 8 hierarchy of components. Thus, optional hierarchies can be generated with which the  
 9 drafter can query others as to which is the preferred hierarchy. The multiple charts can  
 10 be made by duplicating the original chart and then varying only the elements to be  
 11 changed.

12 The hierarchy may next be outputted in various formats and to various areas of a  
 13 patent draft. In a preferred method according to the present invention, the hierarchy of  
 14 elements is outputted in an outline format, a claims format, and a diagrammatic format.

15 The outline format is such that a patent specification can be written from the  
 16 outputted outline. As shown in Figure 2, the outline, generally described as “Title of  
 17 Invention”, is outputted in a format that is viewable by the user(s). Each component of  
 18 the outline may then be described in further detail such that a complete and enabling  
 19 description of the invention is made; advantageously, this additional detail is  
 20 automatically connected, associated, or linked to one of the components shown within the  
 21 diagram. More particularly, the text-based description providing additional detail for  
 22 each key component, subcomponent, and sub-subcomponent may be viewed by the  
 23 user(s) by selecting, e.g., pointing and clicking with a mouse or other selection device

connected with a computer or electronic data organizer capable of running the software program associated with the system, the particular key component, subcomponent, and sub-subcomponent and being automatically connected to a viewable version of the text-based description associated therewith. Modifications to the text-based information input by the user(s) is modifiable at any stage of the method of using the system, once the information has been initially inputted. This text-based description may then be used as the specification of the invention for a patent application or may be used simply to describe an invention for purposes of disclosure or publication; it is automatically assembled into a text-based version of the description of the invention that integrates each key component, subcomponent, and sub-subcomponent in a related, logical, and appropriate order such that the final description is capable of being submitted as a patent application. Additional modifications may be made to the text-based description, once integrated into a single text-based document in order to provide appropriate and/or necessary transition, linkage, coherency, and/or standard text or language required for patent applications by a particular governmental agency or authority.

When the document is completed, the outline may also be outputted for use as a table of contents for the document, including hyperlinking the items in the table of contents to the appropriate sections of the document. Thus, complex technologies can be outlined and described and a table of contents generated with relative ease. Hyperlinking of the table of contents and the sections of the document allows for rapid perusal of the document.

Additionally, the information that is inputted by the user(s) is also automatically generated into a claims format that is included in the patent application text-based

document set forth in the foregoing. This automatically generated claims format is one that preserves the parent/child or hierarchical relationship of the components established in the diagram. This parent/child or hierarchical relationship may be described by using an outline format or simply by the physical relationship between the claims, such as by listing a child component under its parent component and indenting the child component from the margin more than its parent component. Additionally, the claims format that is generated automatically by the software may include a detail of the component, such as a description of the additional function and/or specific benefit conferred by the component to the invention. In any case, the claims format that is automatically generated from the diagram and incorporated into the text-based description document is designed to comport with government requirements for patent applications. The claims are output into a viewable output, as with the diagram and text-based description, such that the user(s) may view, modify, and review them.

Advantageously, the claims output is consistent across technology applications. Thus, regardless of the type of technology that is the subject of the invention, and regardless of the experience of the user(s) or practitioner using the system and method according to the present invention, the claims are automatically generated in a format that conforms to the requirements of a specific patent or intellectual property organization, such as the United States Patent and Trademark Office or with World Intellectual Property Organization. Standard formatting, such as preambles, may also be generated from the inputs and are selectable and modifiable by the user(s) at any point after the initial inputting of the information. Also, standard format claims language may be inserted prior to the description of a component. For example, in figure 3, the second

claim states “The method according to claim 1, wherein the inputted technology elements are selected from the group consisting of Title,  $\geq 1$  key component, function, overall benefit, and combinations thereof.” In this claim, the phrase “The method according to claim” and “wherein the” are standard format claims language that is repeated in each of the dependent claims. Therefore, the method may automatically include these and other phrases in the claims. Because different formats exist for standard format claims language, phrase may be entered or selected prior to generating the claims. Additionally, the claims may be outputted such that they are numbered and they contain in them the number of their parent claim where appropriate.

Additionally, the output may be formatted such that multiple dependent claims are allowed or not allowed, according to the preference of the drafter, patent office, or other authority. Likewise, multiple-multiple dependent claims may be used, if desired or required.

Finally, the technology matrix diagram, along with the text-based information, associations therewith, including links and hyperlinks, and integrated text-based document, may be outputted in a tangible format, either on a computer screen or other electronic data processor or device’s viewable output, printed by a peripheral printing device connected thereto, transmitted electronically to another device or third party, or saved in an electronic format, including on the device or on a portable electronic data storage device, e.g., palm-based organizer or PDA, diskette, CD-rom disk, and the like.

This diagram is a visual representation of the technological hierarchy of the technology or invention. This diagram may be the same diagram used to generate the technological hierarchy or it may be a different diagram. For example, the hierarchy may be outputted

1 in a 2-dimensional format such as a triangular format, a circular format, or an outline  
2 format, or a 3-dimensional format, such as a spherical, conical, or pyramidal format.

3 Frequently, a description of a technology involves many elements, and a  
4 diagrammatic representation of these elements may not fit in a legible manner entirely on  
5 standard A4 or letter paper or on a presentation screen, or slide. In such cases, sections of  
6 the diagram can be identified for exporting to a separate sheet, slide screen, or other the  
7 like. In the cases of patents with multiple independent claims, it may be most appropriate  
8 to represent each of the independent claims separately.

9 Finally, the components of the diagram may be linked to the section of the  
10 specification that describes them. This linking allows a person to get an overall view of  
11 technology, then read in more detail about a particular component of interest by  
12 “jumping” to the linked section of the specification.

13 Also, jumping back and forth between specification, claims, and diagram, because  
14 often the document drafter may think of another component or better ordering of  
15 components after having started writing the specification. This allows for incorporation  
16 of added elements into claims, such that they are not missed. Also, copy and pasting of a  
17 specification element into the technology hierarchical matrix will generate a hyperlink  
18 between diagram and spec and also between spec and table of contents when matrix is  
19 exported to table of contents.

20 The software of the present invention is designed and configured to provide a  
21 graphical interface for diagramming the structure of intellectual property in a patent  
22 application or for assessment of technology or issued patents and for automatically  
23 creating text-based description linked to components in the diagram and integrating those

1 descriptions into a coherent specification and claims of a patent application. The software  
2 also exports the diagram and text-based description into other software programs that  
3 support diagrams and text, such as Microsoft Word software and the like.

4 Also in a preferred embodiment of the present invention, a method for using the  
5 aforementioned system is provided, including the steps of at least one user inputting  
6 information to a computer or other automated electronic device, the information being  
7 ordered in a hierarchical and relational categorization, the computer or device using  
8 software to automatically generate a relational, diagrammatic representation of the patent  
9 or technology being assessed, outputting the information in a format that is viewable and  
10 modifiable by the user(s), automatically generating a text-based format of the information  
11 consistent with the relational, diagrammatic representation of the information that is  
12 consistent with a format that may be submitted for filing a patent, modifying the text-  
13 based format, as required, and outputting a printed or electronic version that may be  
14 conveyed to a third party for review and/or patent filing.

15 At least the following primary steps of the method according to the present  
16 invention are necessary:

- 17 • at least one user entering information for diagram elements
- 18 • the system automatically generating a visual diagram of the elements of the  
19 invention in a hierarchical relational diagram
- 20 • at least one user entering diagram verbage by drafting the text-based detailed  
21 description or verbage of the specification section of the application for each key  
22 component, subcomponent, and sub-subcomponent of the diagram



- viewing the diagram and text-based information in a tangible medium, including but not limited to a viewer screen on an electronic data processor or computer, a printed document, and the like.

In addition to the primary steps by the user(s) the user(s) may also input additional key components, subcomponents, and/or sub-subcomponents. Furthermore, the user(s) may manipulate or move any previously inputted key components, subcomponents, and/or sub-subcomponents by shifting up and shifting down from the diagram, either via menu or directly on the diagram moving elements up and down in order among similarly ranked sibling elements. Shifting up and down conserves all sub-elements of the moved element and automatically updates the diagram as well as any related text-based description associated with each component. Dragging an element and dropping it on top of another element will move the dragged to element and make it a sub-element of the element it is dropped on. An element cannot be moved to one of its own child elements. Dragging and dropping conserves all sub-elements of the moved element.

Entering additional specification and/or claims text or verbage may be done directly in the text-based portion of the document by the user(s) at any time after the initial text-based portion has been inputted by the user(s). The automatic claims construction includes the creation of prefixes or preambles or other introductory language, suffixes or termination language, transition or connective language relating parts within the claim or between/among claims, all of which are editable by the user(s); also, custom claim text or verbage may be input when prompted automatically or later during editing by the user(s).

As can be seen, several benefits are associated with drafting a patent in a manner consistent with a preferred embodiment according to the present invention. Most notably, rapid drafting of patents and thorough effective identification, description, and organization of the patent components is provided by the system and method according to the present invention. Furthermore, editing is facilitated at any stage of the process of drafting a patent application or technology assessment; advantageously, the editing of the diagram at an early stage in the process is possible, thus reducing or eliminating time-consuming reorganization and editing at later stages in the process. Also, editing is facilitated in that from the diagram an editor can determine where in the specification to edit a specific claim or text-based portion of the specification and be automatically transferred to that portion of the text-based document, simply by accessing it via the appropriate key component, subcomponent, and/or sub-subcomponent within the diagram, as well as editing the diagram, which automatically edits the relationship within the text-based portion of the integrated document, including location within the specification description and claims.

Also advantageously, the system and method of the present invention as set forth in the foregoing provide ease of refreshing the at least one user's memory of the patent or technology, for example when revisiting claims during the prosecution phase of a patent application, or when consideration of possible infringement or enforcement of the patent is required; this saves time and also permits a multiplicity of users to access this information with similar ease, since the format, language, and use of the system provides for consistency among users and across technologies. Furthermore, the diagrammatic representation of the components in a hierarchical and relational manner provides a

1 useful tool that facilitates the description and explanation of the scope and substance of  
2 patent claims and intellectual property covered by patent to interested third parties,  
3 including inventors (where a practitioner drafted the application on his/her behalf),  
4 management and decision-makers within a company who require quick summaries of  
5 patents and technology for business decision-making, stakeholders and investors in the  
6 patent and/or technology, enforcers of the patent, and the like.

7 Since many patents and technologies being drafted and/or assessed are complex  
8 but need to be considered by a variety of individuals having various levels of technology  
9 and legal understanding, the diagrammatic representation of the patent and/or technology  
10 provided by the present invention is easier to comprehend in a shorter period of time  
11 without having to review text-based descriptions of the same.

#### 12 EXAMPLE

13 As set forth in the foregoing, the software of the present invention is designed and  
14 configured to provide a graphical interface for diagramming the structure of intellectual  
15 property in a patent application or for assessment of technology or issued patents and for  
16 automatically creating text-based description linked to components in the diagram and  
17 integrating those descriptions into a coherent specification and claims of a patent  
18 application. The software also exports the diagram and text-based description into other  
19 software programs that support diagrams and text, such as Microsoft Word software and  
20 the like.

#### 21 PROTOTYPE PROGRAM

22 The software of the system according to the present invention is designed and  
23 established to aid in diagramming intellectual property, displaying and manipulating the  
24 diagram in a way helpful to the patent drafters and clients, and converting the diagram

into an actual patent application. The beta version set forth in this example was programmed in C++ using MFC and the Microsoft Visual C++ Standard Edition programming environment; other languages, e.g., Java, may alternatively be employed without departing from the scope of the present invention. The software of this example is capable of running on Microsoft Windows 2000, ME, NT 4.0, and 98; it requires under 10 MB hard disk space and under 8 MB of free RAM and is implemented as desktop application software. The software was developed using Microsoft Visual C++ and MFC, which permits it to interact well with the Windows operating system and Microsoft Office applications.

The following description of a software program developed as a prototype version of the software according to the system of the present invention is set forth by way of example and not of limitation. A prototype program was developed and implemented as a Windows MFC application using Microsoft Visual C++ as the primary programming environment. Other programming languages and systems may be advantageously employed without departing from the scope of the present invention, as it is described and claimed herein. The prototype program, set forth for example and not limitation, supports, at a minimum:

- A MS Windows application that integrates with the Windows desktop environment
- Entry of the patent or technology matrix diagram in a text-based, non-graphical format
- Entry of the patent or technology matrix diagram in a graphical format
- Basic sorting, editing, and rearranging of MATRIX elements

1       • Basic print functions

2       • Basic file storage and retrieval to allow saving and opening of MATRIX  
3 documents

4       • Basic patent draft exporting

5       • A rough draft of a users manual

6 Other features are optional but advantageous for the software of the system according to  
7 the present invention, including:

8       • Enhanced Graphical User Interface (GUI) with user-friendly buttons, menus, help  
9 screens, and toolbars

10       • Incorporation of logos and icons

11       • Automatic linking or hyperlinking between the diagram components and text-  
12 based detailed description of those components, including prior art summaries and  
13 patents provided in a connectable on-line database

14 Other program features of the software may advantageously include:

15       • Enhanced and streamline GUI that provides a professional interface complete with all  
16 standard features of modern Windows applications (cut and paste, multi-document  
17 support, multiple file export formats, etc.); note that LINUX or other operating  
18 system structures are contemplated within the scope of the present invention

19       • Help dialogs accessible within the program operation by user(s)

20       • Graphical “bubble diagram” views of the diagram and document, complete with  
21 ability to click and drag elements to new locations; from this view user(s) may  
22 intelligently move elements around to make diagram aesthetically pleasing without  
23 departing from the hierarchical and relational structure of the component diagram

- Enhanced sharing and editing features that permit multiple users, including practitioners, clients and law firms to concurrently develop or view the diagram and/or document

#### Data Structure

Each element of the diagram is implemented as an object of an element class within the prototype software example according to the present invention. The diagram itself takes the form of a data tree. A header object that contains specifications of the diagram, including job number, client name, and title information is provided. The header object also contains a pointer to the first key component of the diagram. For the purposes of diagramming, key components are not different from regular elements, unless so identified by the user(s). According to the hierarchical relationship of components, each parent element or key component contains a pointer to the first child element or subcomponent of that element and the next sister element of that element. Thus the data structure of a very simple diagram may be viewed, in one configuration, as follows in

Chart 1:

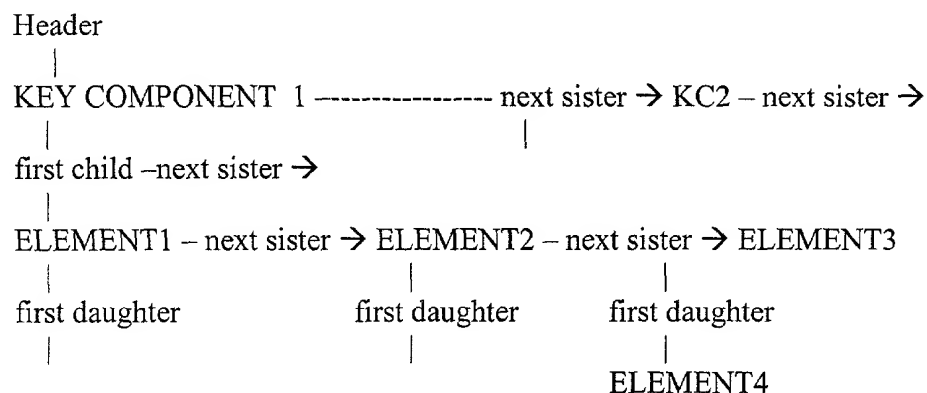


Chart 1. Diagram data structure for Example

1 This linked tree structure enables elements to be easily moved, sorted, and  
2 graphically rendered with a minimum of processing delay and memory usage. The  
3 element class also contains information about whether or not an element is simply a  
4 component of its parent or represents a dependent claim, as well as other information to  
5 facilitate easy manipulation of the data.

6 Drafting a patent application or technology assessment document using the  
7 system and software according to the present invention consists of three primary steps by  
8 a user:

- 9 • Setting up a new diagram is simply entering the client and invention names and  
10 assigning the diagram a docket number, where appropriate, particularly if a  
11 practitioner is drafting the application on behalf of a client/inventor.
- 12 • Entering diagram elements involves entering information from which a visual  
13 diagram of the elements of the invention is automatically constructed in a  
14 hierarchical relational diagram
- 15 • Entering diagram verbage involves drafting the text-based detailed description or  
16 verbage of the specification section of the application for each key component,  
17 subcomponent, and sub-subcomponent of the diagram.

18 In addition to the primary steps by the user(s) the user(s) may also input additional key  
19 components, subcomponents, and/or sub-subcomponents. Furthermore, the user(s) may  
20 manipulate or move any previously inputted key components, subcomponents, and/or  
21 sub-subcomponents by shifting up and shifting down from the diagram, either via menu  
22 or directly on the diagram moving elements up and down in order among similarly  
23 ranked sibling elements. Shifting up and down conserves all sub-elements of the moved

1 element and automatically updates the diagram as well as any related text-based  
2 description associated with each component. Dragging an element and dropping it on top  
3 of another element will move the dragged to element and make it a sub-element of the  
4 element it is dropped on. An element cannot be moved to one of its own child elements.  
5 Dragging and dropping conserves all sub-elements of the moved element.

6       Entering additional specification and/or claims text or verbage may be done  
7 directly in the text-based portion of the document by the user(s) at any time after the  
8 initial text-based portion has been inputted by the user(s). The automatic claims  
9 construction includes the creation of prefixes or preambles or other introductory  
10 langauage, suffixes or termination language, transition or connective language relating  
11 parts within the claim or between/among claims, all of which are editable by the user(s);  
12 also, custom claim text or verbage may be input when prompted automatically or later  
13 during editing by the user(s).

14       A draft patent application, including the diagram, specification, and claims, as  
15 well as any figures, hyperlinks, prior art, etc. can be exported to an HTML or XML or  
16 similar file.

17       Certain modifications and improvements will occur to those skilled in the art upon  
18 a reading of the foregoing description. By way of example, alternative representations of  
19 the hierarchical diagrammatic representation of components of a patent or technology are  
20 possible without departing from the scope of the present invention. The vertical and  
21 horizontal-based diagrams set forth hereinabove are simply one preferred embodiment set  
22 forth for facilitating the description of the present invention. Also, a mulitplicity of users  
23 may be working on the same patent application at the same time, via a connection of



1 computers or data processing devices that provides for intercommunication electronically  
2 between the devices used by different users; integration of the work of the multiplicity of  
3 users is provided automatically by the system and method of the present invention. Also,  
4 application of the system and method according to the present invention may be  
5 employed for patent and/or technology mapping to graphically or diagrammatically  
6 identify and/or describe the scope and depth of a particular patent or patent portfolio,  
7 grouping of patents, competitive intellectual property and technology and/or technology  
8 distribution within any industry, market, or technology application. All modifications and  
9 improvements have been deleted herein for the sake of conciseness and readability but  
10 are properly within the scope of the following claims.

11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100  
101  
102  
103  
104  
105  
106  
107  
108  
109  
110  
111  
112  
113  
114  
115  
116  
117  
118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192  
193  
194  
195  
196  
197  
198  
199  
200  
201  
202  
203  
204  
205  
206  
207  
208  
209  
210  
211  
212  
213  
214  
215  
216  
217  
218  
219  
220  
221  
222  
223  
224  
225  
226  
227  
228  
229  
230  
231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248  
249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264  
265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321  
322  
323  
324  
325  
326  
327  
328  
329  
330  
331  
332  
333  
334  
335  
336  
337  
338  
339  
340  
341  
342  
343  
344  
345  
346  
347  
348  
349  
350  
351  
352  
353  
354  
355  
356  
357  
358  
359  
360  
361  
362  
363  
364  
365  
366  
367  
368  
369  
370  
371  
372  
373  
374  
375  
376  
377  
378  
379  
380  
381  
382  
383  
384  
385  
386  
387  
388  
389  
390  
391  
392  
393  
394  
395  
396  
397  
398  
399  
400  
401  
402  
403  
404  
405  
406  
407  
408  
409  
410  
411  
412  
413  
414  
415  
416  
417  
418  
419  
420  
421  
422  
423  
424  
425  
426  
427  
428  
429  
430  
431  
432  
433  
434  
435  
436  
437  
438  
439  
440  
441  
442  
443  
444  
445  
446  
447  
448  
449  
450  
451  
452  
453  
454  
455  
456  
457  
458  
459  
460  
461  
462  
463  
464  
465  
466  
467  
468  
469  
470  
471  
472  
473  
474  
475  
476  
477  
478  
479  
480  
481  
482  
483  
484  
485  
486  
487  
488  
489  
490  
491  
492  
493  
494  
495  
496  
497  
498  
499  
500  
501  
502  
503  
504  
505  
506  
507  
508  
509  
510  
511  
512  
513  
514  
515  
516  
517  
518  
519  
520  
521  
522  
523  
524  
525  
526  
527  
528  
529  
530  
531  
532  
533  
534  
535  
536  
537  
538  
539  
540  
541  
542  
543  
544  
545  
546  
547  
548  
549  
550  
551  
552  
553  
554  
555  
556  
557  
558  
559  
560  
561  
562  
563  
564  
565  
566  
567  
568  
569  
570  
571  
572  
573  
574  
575  
576  
577  
578  
579  
580  
581  
582  
583  
584  
585  
586  
587  
588  
589  
590  
591  
592  
593  
594  
595  
596  
597  
598  
599  
600  
601  
602  
603  
604  
605  
606  
607  
608  
609  
610  
611  
612  
613  
614  
615  
616  
617  
618  
619  
620  
621  
622  
623  
624  
625  
626  
627  
628  
629  
630  
631  
632  
633  
634  
635  
636  
637  
638  
639  
640  
641  
642  
643  
644  
645  
646  
647  
648  
649  
650  
651  
652  
653  
654  
655  
656  
657  
658  
659  
660  
661  
662  
663  
664  
665  
666  
667  
668  
669  
670  
671  
672  
673  
674  
675  
676  
677  
678  
679  
680  
681  
682  
683  
684  
685  
686  
687  
688  
689  
690  
691  
692  
693  
694  
695  
696  
697  
698  
699  
700  
701  
702  
703  
704  
705  
706  
707  
708  
709  
710  
711  
712  
713  
714  
715  
716  
717  
718  
719  
720  
721  
722  
723  
724  
725  
726  
727  
728  
729  
730  
731  
732  
733  
734  
735  
736  
737  
738  
739  
740  
741  
742  
743  
744  
745  
746  
747  
748  
749  
750  
751  
752  
753  
754  
755  
756  
757  
758  
759  
760  
761  
762  
763  
764  
765  
766  
767  
768  
769  
770  
771  
772  
773  
774  
775  
776  
777  
778  
779  
780  
781  
782  
783  
784  
785  
786  
787  
788  
789  
790  
791  
792  
793  
794  
795  
796  
797  
798  
799  
800  
801  
802  
803  
804  
805  
806  
807  
808  
809  
810  
811  
812  
813  
814  
815  
816  
817  
818  
819  
820  
821  
822  
823  
824  
825  
826  
827  
828  
829  
830  
831  
832  
833  
834  
835  
836  
837  
838  
839  
840  
841  
842  
843  
844  
845  
846  
847  
848  
849  
850  
851  
852  
853  
854  
855  
856  
857  
858  
859  
860  
861  
862  
863  
864  
865  
866  
867  
868  
869  
870  
871  
872  
873  
874  
875  
876  
877  
878  
879  
880  
881  
882  
883  
884  
885  
886  
887  
888  
889  
890  
891  
892  
893  
894  
895  
896  
897  
898  
899  
900  
901  
902  
903  
904  
905  
906  
907  
908  
909  
910  
911  
912  
913  
914  
915  
916  
917  
918  
919  
920  
921  
922  
923  
924  
925  
926  
927  
928  
929  
930  
931  
932  
933  
934  
935  
936  
937  
938  
939  
940  
941  
942  
943  
944  
945  
946  
947  
948  
949  
950  
951  
952  
953  
954  
955  
956  
957  
958  
959  
960  
961  
962  
963  
964  
965  
966  
967  
968  
969  
970  
971  
972  
973  
974  
975  
976  
977  
978  
979  
980  
981  
982  
983  
984  
985  
986  
987  
988  
989  
990  
991  
992  
993  
994  
995  
996  
997  
998  
999  
1000  
1001  
1002  
1003  
1004  
1005  
1006  
1007  
1008  
1009  
1010  
1011  
1012  
1013  
1014  
1015  
1016  
1017  
1018  
1019  
1020  
1021  
1022  
1023  
1024  
1025  
1026  
1027  
1028  
1029  
1030  
1031  
1032  
1033  
1034  
1035  
1036  
1037  
1038  
1039  
1040  
1041  
1042  
1043  
1044  
1045  
1046  
1047  
1048  
1049  
1050  
1051  
1052  
1053  
1054  
1055  
1056  
1057  
1058  
1059  
1060  
1061  
1062  
1063  
1064  
1065  
1066  
1067  
1068  
1069  
1070  
1071  
1072  
1073  
1074  
1075  
1076  
1077  
1078  
1079  
1080  
1081  
1082  
1083  
1084  
1085  
1086  
1087  
1088  
1089  
1090  
1091  
1092  
1093  
1094  
1095  
1096  
1097  
1098  
1099  
1100  
1101  
1102  
1103  
1104  
1105  
1106  
1107  
1108  
1109  
1110  
1111  
1112  
1113  
1114  
1115  
1116  
1117  
1118  
1119  
1120  
1121  
1122  
1123  
1124  
1125  
1126  
1127  
1128  
1129  
1130  
1131  
1132  
1133  
1134  
1135  
1136  
1137  
1138  
1139  
1140  
1141  
1142  
1143  
1144  
1145  
1146  
1147  
1148  
1149  
1150  
1151  
1152  
1153  
1154  
1155  
1156  
1157  
1158  
1159  
1160  
1161  
1162  
1163  
1164  
1165  
1166  
1167  
1168  
1169  
1170  
1171  
1172  
1173  
1174  
1175  
1176  
1177  
1178  
1179  
1180  
1181  
1182  
1183  
1184  
1185  
1186  
1187  
1188  
1189  
1190  
1191  
1192  
1193  
1194  
1195  
1196  
1197  
1198  
1199  
1200  
1201  
1202  
1203  
1204  
1205  
1206  
1207  
1208  
1209  
1210  
1211  
1212  
1213  
1214  
1215  
1216  
1217  
1218  
1219  
1220  
1221  
1222  
1223  
1224  
1225  
1226  
1227  
1228  
1229  
1230  
1231  
1232  
1233  
1234  
1235  
1236  
1237  
1238  
1239  
1240  
1241  
1242  
1243  
1244  
1245  
1246  
1247  
1248  
1249  
1250  
1251  
1252  
1253  
1254  
1255  
1256  
1257  
1258  
1259  
1260  
1261  
1262  
1263  
1264  
1265  
1266  
1267  
1268  
1269  
1270  
1271  
1272  
1273  
1274  
1275  
1276  
1277  
1278  
1279  
1280  
1281  
1282  
1283  
1284  
1285  
1286  
1287  
1288  
1289  
1290  
1291  
1292  
1293  
1294  
1295  
1296  
1297  
1298  
1299  
1300  
1301  
1302  
1303  
1304  
1305  
1306  
1307  
1308  
1309  
1310  
1311  
1312  
1313  
1314  
1315  
1316  
1317  
1318  
1319  
1320  
1321  
1322  
1323  
1324  
1325  
1326  
1327  
1328  
1329  
1330  
1331  
1332  
1333  
1334  
1335  
1336  
1337  
1338  
1339  
1340  
1341  
1342  
1343  
1344  
1345  
1346  
1347  
1348  
1349  
1350  
1351  
1352  
1353  
1354  
1355  
1356  
1357  
1358  
1359  
1360  
1361  
1362  
1363  
1364  
1365  
1366  
1367  
1368  
1369  
1370  
1371  
1372  
1373  
1374  
1375  
1376  
1377  
1378  
1379  
1380  
1381  
1382  
1383  
1384  
1385  
1386  
1387  
1388  
1389  
1390  
1391  
1392  
1393  
1394  
1395  
1396  
1397  
1398  
1399  
1400  
1401  
1402  
1403  
1404  
1405  
1406  
1407  
1408  
1409  
1410  
1411  
1412  
1413  
1414  
1415  
1416  
1417  
1418  
1419  
1420  
1421  
1422  
1423  
1424  
1425  
1426  
1427  
1428  
1429  
1430  
1431  
1432  
1433  
1434  
1435  
1436  
1437  
1438  
1439  
1440  
1441  
1442  
1443  
1444  
1445  
1446  
1447  
1448  
1449  
1450  
1451  
1452  
1453  
1454  
1455  
1456  
1457  
1458  
1459  
1460  
1461  
1462  
1463  
1464  
1465  
1466  
1467  
1468  
1469  
1470  
1471  
1472  
1473  
1474  
1475  
1476  
1477  
1478  
1479  
1480  
1481  
1482  
1483  
1484  
1485  
1486  
1487  
1488  
1489  
1490  
1491  
1492  
1493  
1494  
1495  
1496  
1497  
1498  
1499  
1500  
1501  
1502  
1503  
1504  
1505  
1506  
1507  
1508  
1509  
1510  
1511  
1512  
1513  
1514  
1515  
1516  
1517  
1518  
1519  
1520  
1521  
1522  
1523  
1524  
1525  
1526  
1527  
1528  
1529  
1530  
1531  
1532  
1533  
1534  
1535  
1536  
1537  
1538  
1539  
1540  
1541  
1542  
1543  
1544  
1545  
1546  
1547  
1548  
1549  
1550  
1551  
1552  
1553  
1554  
1555  
1556  
1557  
1558  
1559  
1560  
1561  
1562  
1563  
1564  
1565  
1566  
1567  
1568  
1569  
1570  
1571  
1572  
1573  
1574  
1575  
1576  
1577  
1578  
1579  
1580  
1581  
1582  
1583  
1584  
1585  
1586  
1587  
1588  
1589  
1590  
1591  
1592  
1593  
1594  
1595  
1596  
1597  
1598  
1599  
1600  
1601  
1602  
1603  
1604  
1605  
1606  
1607  
1608  
1609  
1610  
1611  
1612  
1613  
1614  
1615  
1616  
1617  
1618  
1619  
1620  
1621  
1622  
1623  
1624  
1625  
1626  
1627  
1628  
1629  
1630  
1631  
1632  
1633  
1634  
1635  
1636  
1637  
1638  
1639  
1640  
1641  
1642  
1643  
1644  
1645  
1646  
1647  
1648  
1649  
1650  
1651  
1652  
1653  
1654  
1655  
1656  
1657  
1658  
1659  
1660  
1661  
1662  
1663  
1664  
1665  
1666  
1667  
1668  
1669  
1670  
1671  
1672  
1673  
1674  
1675  
1676  
1677  
1678  
1679  
1680  
1681  
1682  
1683  
1684  
1685  
1686  
1687  
1688  
1689  
1690  
1691  
1692  
1693  
1694  
1695  
1696  
1697  
1698  
1699  
1700  
1701  
1702  
1703  
1704  
1705  
1706  
1707  
1708  
1709  
1710  
1711  
1712  
1713  
1714  
1715  
1716  
1717  
1718  
1719  
1720  
1721  
1722  
1723  
1724  
1725  
1726  
1727  
1728  
1729  
1730  
1731  
1732  
1733  
1734  
1735  
1736  
1737  
1738  
1739  
1740  
1741  
1742  
1743  
1744  
1745  
1746  
1747  
1748  
1749  
1750  
1751  
1752  
1753  
1754  
1755  
1756  
1757  
1758  
1759  
1760  
1761  
1762  
1763  
1764  
1765  
1766  
1767  
1768  
1769  
1770  
1771  
1772  
1773  
1774  
1775  
1776  
1777  
1778  
1779  
1780  
1781  
1782  
1783  
1784  
1785  
1786  
1787  
1788  
1789  
1790  
1791  
1792  
1793  
1794  
1795  
1796  
1797  
1798  
1799  
1800  
1801  
1802  
1803  
1804  
1805  
1806  
1807  
1808  
1809  
1810  
1811  
1812  
1813  
1814  
1815  
1816  
1817  
1818  
1819  
1820  
1821  
1822  
1823  
1824  
1825  
1826  
1827  
1828  
1829  
1830  
1831  
1832  
1833  
1834  
1835  
1836  
1837  
1838  
1839  
1840  
1841  
1842  
1843  
1844  
1845  
1846  
1847  
1848  
1849  
1850  
1851  
1852  
1853  
1854  
1855  
1856  
1857  
1858  
1859  
1860  
1861  
1862  
1863  
1864  
1865  
1866  
1867  
1868  
1869  
1870  
1871  
1872  
1873  
1874  
1875  
1876  
1877  
1878  
1879  
1880  
1881  
1882  
1883  
1884  
1885  
1886  
1887  
1888  
1889  
1890  
1891  
1892  
1893  
1894  
1895  
1896  
1897  
1898  
1899  
1900  
1901  
1902  
1903  
1904  
1905  
1906  
1907  
1908  
1909  
1910  
1911  
1912  
1913  
1914  
1915  
1916  
1917  
1918  
1919  
1920  
1921  
1922  
1923  
1924  
1925  
1926  
1927  
1928  
1929  
1930  
1931  
1932  
1933  
1934  
1935  
1936  
1937  
1938  
1939  
1940  
1941  
1942  
1943  
1944  
1945  
1946  
1947  
1948  
1949  
1950  
1951  
1952  
1953  
1954  
1955  
1956  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985  
1986  
1987  
1988  
1989  
1990  
1991  
1992  
1993  
1994  
1995  
1996  
1997  
1998  
1999  
2000  
2001  
2002  
2003  
2004  
2005  
2006  
2007  
2008  
2009  
2010  
2011  
2012  
2013  
2014  
2015  
2016  
2017  
2018  
2019  
2020  
2021  
2022  
2023  
2024  
2025  
2026  
2027  
2028  
2029  
2030  
2031  
2032  
2033  
2034  
2035  
2036  
2037  
2038  
2039  
2040  
2041  
2042  
2043  
2044  
2045  
2046  
2047  
2048  
2049  
2050  
2051  
2052  
2053  
2054  
2055  
2056  
2057  
2058  
2059  
2060  
2061  
2062  
2063  
2064  
2065  
2066  
2067  
2068  
2069  
2070  
2071  
2072  
2073  
2074  
2075  
2076  
2077  
2078  
2079  
2080  
2081  
2082  
2083  
2084  
2085  
2086  
2087  
2088  
2089  
2090  
2091  
2092  
2093  
2094  
2095  
2096  
2097  
2098  
2099  
2100  
2101  
2102  
2103  
2104  
2105  
2106  
2107  
2108  
2109  
2110  
2111  
2112  
2113  
2114  
2115  
2116  
2117  
2118  
2119  
2120  
2121  
2122  
2123  
2124  
2125  
2126  
2127  
2128  
2129  
2130  
2131  
2132  
2133  
2134  
2135  
2136  
2137  
2138  
2139  
2140  
2141  
2142  
2143  
2144  
2145  
2146  
2147  
2148  
2149  
2150  
2151  
2152  
2153  
2154  
2155  
2156  
2157  
2158  
2159  
2160  
2161  
2162  
2163  
2164  
2165  
2166  
2167  
2168  
2169  
2170  
2171  
2172  
2173  
2174  
2175  
2176  
2177  
2178  
2179  
2180  
2181  
2182  
2183  
2184  
2185  
2186  
2187  
2188  
2189  
2190  
2191  
2192  
2193  
2194  
2195  
2196  
2197  
2198  
2199  
2200  
2201  
2202  
2203  
2204  
2205  
2206  
2207  
2208  
2209  
2210  
2211  
2212  
2213  
2214  
2215  
2216  
22